

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 07-050614

(43)Date of publication of application : 21.02.1995

(51)Int.Cl.

H04B 1/707

H03H 9/44

(21)Application number : 05-197097

(71)Applicant : HITACHI LTD

(22)Date of filing : 09.08.1993

(72)Inventor : SHIBA TAKASHI

HIKINO OSAMU

IKEDA HIROAKI

YAMADA YOSHIHIRO

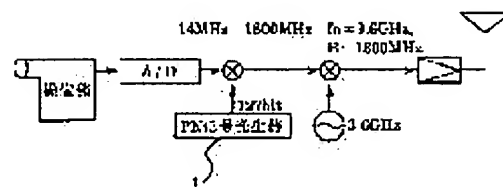
ITO KATSUMI

## (54) RADIO VIDEO SIGNAL PROCESSOR

### (57)Abstract:

**PURPOSE:** To separate an image pickup part and a signal recording part and to miniaturize the image pickup part by using a spread spectrum communication system as the communication means of video signals between the image pickup part and the signal recording part.

**CONSTITUTION:** The video signals inputted from an image pickup device are converted to digital signals (14MHz) and then directly spread by being mixed with the output of an PN signal generator 1. A center frequency is up-converted to 3.6GHz and signals are amplified by an amplifier further and outputted from an antenna. When spectrums are spread and transmission is performed in such a manner, since the signals are at a small level in terms of execution, other equipments are not interfered. In the signal recording part, the signals inputted from the antenna are amplified, passed through a SAW matched filter and thus, converted to the impulsive correlation of 14MHz. In a signal recording element, the digital signals are directly recorded or recorded after they are tentatively returned to analog signals.



\* NOTICES \*

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

## CLAIMS

---

[Claim(s)]

[Claim 1] A means to acquire video information.

Output equipment, such as record of a video signal, or a picture monitor.

It is the radio video signal processing unit provided with the above, and spread spectrum communication was used as a means of communication of a video signal.

[Claim 2] A means to acquire video information.

A means to change a video signal into a digital signal.

Output equipment, such as record of a video signal, or a picture monitor.

It is the radio video signal processing unit according to claim 1 provided with the above, and spread spectrum communication was used as a means of communication of a video signal.

[Claim 3] The radio video signal processing unit according to claim 1 characterized by using an imaging device as a means to acquire video information.

[Claim 4] The radio video signal processing unit according to claim 1 using a surface acoustic wave apparatus as abnormal conditions or a demodulation means of spread spectrum communication as a means of communication of a video signal.

[Claim 5] The radio video signal processing unit according to claim 1 being mixed on suitable frequency after spectrum spread modulation as a means of communication of a video signal, and communicating by carrying out upconverting of the center frequency of a signal.

[Claim 6] The radio video signal processing unit comprising according to claim 1:

A means which divides a video signal into a suitable group on a time-axis, divides them into some systems further, carries out time-axis extension, changes center frequency, a PN code, or both, respectively, and carries out spectrum spread modulation.

A means which divides and carries out spectrum spread demodulation of center frequency, a

PN code, or both to a system changed, respectively.

A means to carry out time base compaction of each demodulation signal, and to compound it.

---

[Translation done.]

\* NOTICES \*

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

## DETAILED DESCRIPTION

---

[Detailed Description of the Invention]

[0001]

[Industrial Application]This invention relates to the radio video signal processing unit which used the spread spectrum communication system.

[0002]

[Description of the Prior Art]About the conventional video signal processing unit, transmission of the video signal was performed using the cable, for example as shown in JP,53-113419,A. An image pick-up part and a signal recording part are arranged in the same device, or need to carry a signal recording part together with an image pick-up part, for this reason, the whole device connected with the cable becomes large, and there is a limit in a miniaturization.

[0003]

[Problem(s) to be Solved by the Invention]The purpose of this invention solves an above-mentioned technical problem, separates an image pick-up part and a signal recording part, and there is in exchanging between each device on radio, and providing a new structure of the suitable picture signal processing unit for a miniaturization with little disturbance to other apparatus.

[0004]

[Means for Solving the Problem]The above-mentioned technical problem can solve an exchange of a signal between an image pick-up part and a signal recording part by using spread spectrum communication.

[0005]

[Function]An image pick-up part and a signal recording part can be separated without doing disturbance to other apparatus, since a signal level is stopped enough and-izing of it can be carried out [ radio ] with the above-mentioned technique.

[0006]

[Example] Hereafter, the example of this invention is described using drawing 5 and Table 1 from drawing 1.

[0007] Drawing 1 is a system block of the image pick-up part of the 1st example of this invention. It is directly spread by changing into a digital signal (14 MHz) the video signal inputted from an image sensor, next mixing with the output of the PN signal (pseudo noise code signal) generator 1. The PN code used 127-bit m series numerals. Upconverting of the center frequency is carried out to 3.6 GHz, and it is further amplified by an amplifier, and outputs from an antenna. As mentioned above, if a spectrum is diffused and it transmits, since it is a signal of a level small in execution, disturbance to other apparatus will not be done.

[0008] Drawing 2 is a system block of the signal recording part of the 1st example of this invention. By being amplified by an amplifier and passing the SAW (surface acoustic wave) matched filter 2, the signal inputted from an antenna is changed into the correlation signal of the shape of a 14-MHz impulse, and is changed into a digital signal by the pulse discrimination circuit. In a signal recording element, once it returns [ directly or ] a digital signal to an analog signal, it is recorded.

[0009] As mentioned above, according to this example, since an image pick-up part and a signal recording part are separable, the miniaturization of an image pick-up part can be attained.

[0010] It is difficult to create the SAW matched filter for a recovery in the 1st example, since the center frequency of a sending signal is high. So, in the 2nd example, center frequency was lowered by dividing the Motonobu item into ten. Drawing 3 is a system block of the image pick-up part of the 2nd example of this invention. The video signal inputted from an image sensor was changed into the digital signal (14 MHz), the signal was divided into ten on time sequence, and the signal band was each system 1.4 MHz in the time-base-expansion circuit. Next, by mixing with an output of the PN signal (pseudo noise code signal) generator 1 different, respectively, it is spread directly, and by the signal of frequency (720 MHz - 820 MHz) different further, respectively, it is mixed by each system and upconverting is carried out to it.

Furthermore, each signal is added, is amplified by an amplifier and outputted from an antenna. As mentioned above, like the 1st example, if a spectrum is diffused and it transmits, since it is a signal of a level small in execution, disturbance to other apparatus will not be done.

[0011] Drawing 4 is a system block of the signal recording part of the 2nd example of this invention. By being amplified by an amplifier and passing the SAW (surface acoustic wave) matched filter 2 corresponding to ten kinds of PN codes, and center frequency, the signal inputted from an antenna is changed into an impulse-like correlation signal, and is changed into a digital signal by the pulse decision circuit. After time compression is carried out by the time compression circuit, each signal is added by the merge circuit, and once it returns [ directly or ] a digital signal to an analog signal, it is recorded by a signal recording element.

[0012]As mentioned above, since according to this example signal center frequency can be lowered and a SAW matched filter can be created easily, it is advantageous to low-pricing.

[0013]

[Table 1]

表 1

項目	レベル	備 考
送信出力	-80dBm	電波法規制(-70dBm)以下
伝播損失	-2dB	
初段増幅	20dB	
10分配	-10dB	
マッチドフィルタ損失	-10dB	
処理利得	21dB	(180MHz/1.4MHz)
総合信号	-61dBm	デジタル処理前
入力雑音	-91dBm	(KBT), B=180MHz
初段NF	4dB	
初段増幅	20dB	
10分配	-10dB	
マッチドフィルタ損失	-10dB	
総合雑音	-87dBm	デジタル処理前
総合S/N	26dB	デジタル処理前
必要S/N	10dB	デジタル処理時
余裕度	16dB	

[0014]Table 1 is a signal of the 2nd example, and noise level. S/N reservation of about 26 dB (before digital processing) is possible in this system. Therefore, if required S/N at the time of digital processing shall be 10 dB, the degree of system margin of 16 dB is obtained, and can build a good system.

[0015]As mentioned above, although the SAW (surface acoustic wave) matched filter was used for the signal recording part (signal recovery side) here, this device can be used also for an image pick-up part (signal abnormal-conditions side) by using an impulse generator.

[0016]Drawing 5 shows typically the composition of the SAW matched filter used in the 2nd example of the above. In order to suppress the characteristic change by a temperature change, ten blind-like electrodes are arranged on the same board (ST-Quartz). In order to suppress the impedance difference by the difference in the electrode logarithm of an input-and-output blind-like electrode, a delay circuit and a blind-like electrode are combined with an input side, and piezoelectric thin films ( $\text{LiNbO}_3$ ,  $\text{ZnO}$ , etc.) are formed further. The opening of

one series set 290 micrometers and an input impedance to 625 ohms, and was 50 ohms in output impedance, and we decided to press down a mismatch loss as much as possible.

[0017]

[Effect of the Invention]As mentioned above, according to this invention, since an image pick-up part and a signal recording part can be separated without doing disturbance to other apparatus since a signal level is stopped enough and-izing of it can be carried out [ radio ], the miniaturization of an image pick-up part can be attained.

---

[Translation done.]

\* NOTICES \*

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

## DESCRIPTION OF DRAWINGS

---

[Brief Description of the Drawings]

[Drawing 1] It is a system block figure of the image pick-up part of the 1st example of this invention.

[Drawing 2] It is a system block figure of the signal recording part of the 1st example of this invention.

[Drawing 3] It is a system block figure of the image pick-up part of the 2nd example of this invention.

[Drawing 4] It is a system block figure of the signal recording part of the 2nd example of this invention.

[Drawing 5] It is a mimetic diagram of the surface acoustic wave matched filter used for the 2nd example of this invention.

[Description of Notations]

1 -- PN code generator

2 -- SAW (surface acoustic wave) matched filter.

---

[Translation done.]

## \* NOTICES \*

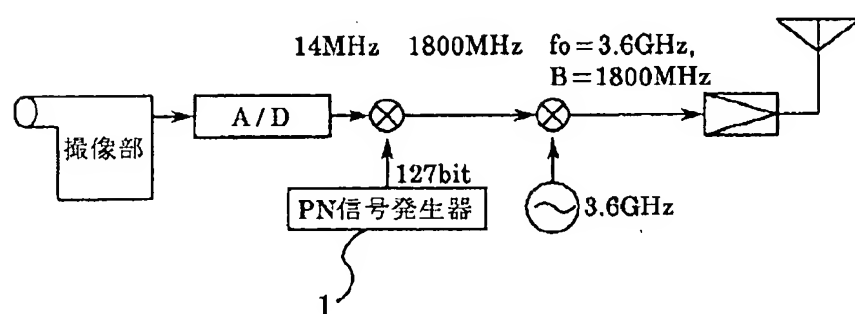
JPO and INPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DRAWINGS

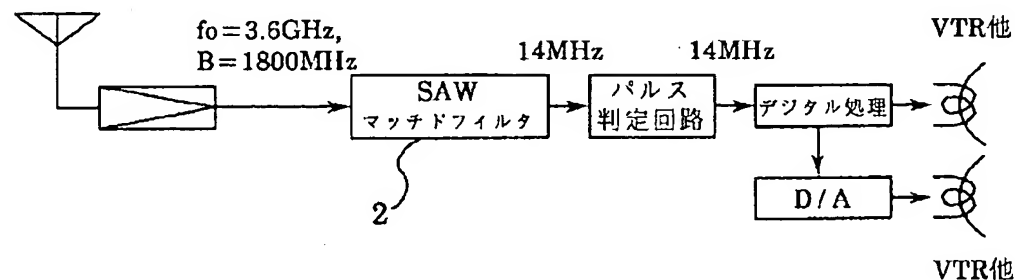
[Drawing 1]

図 1



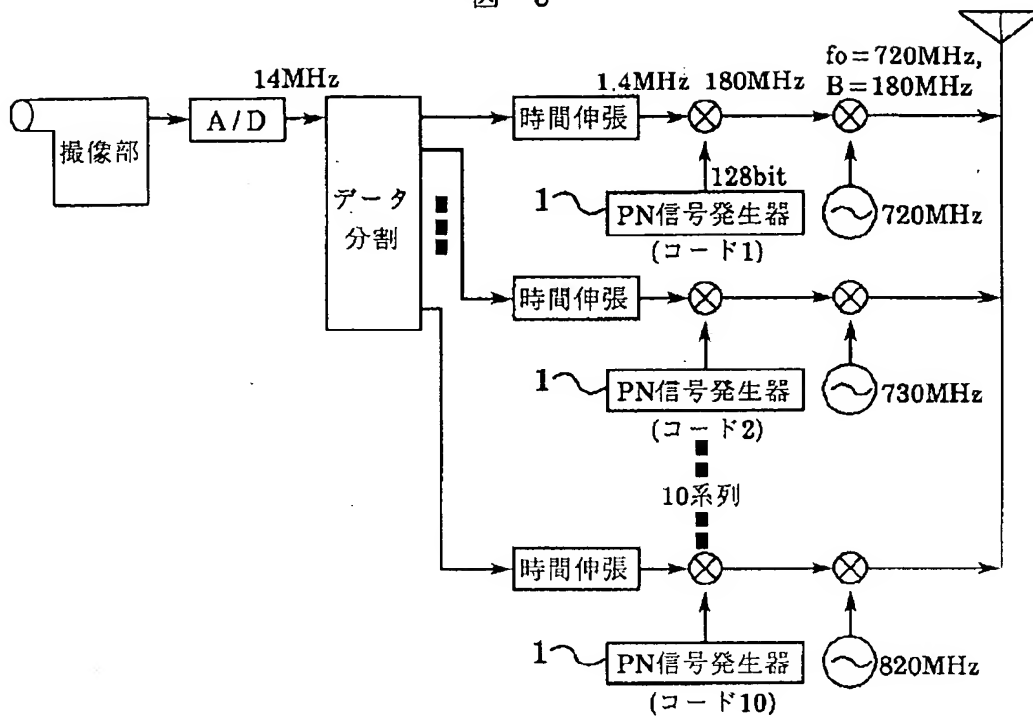
[Drawing 2]

図 2



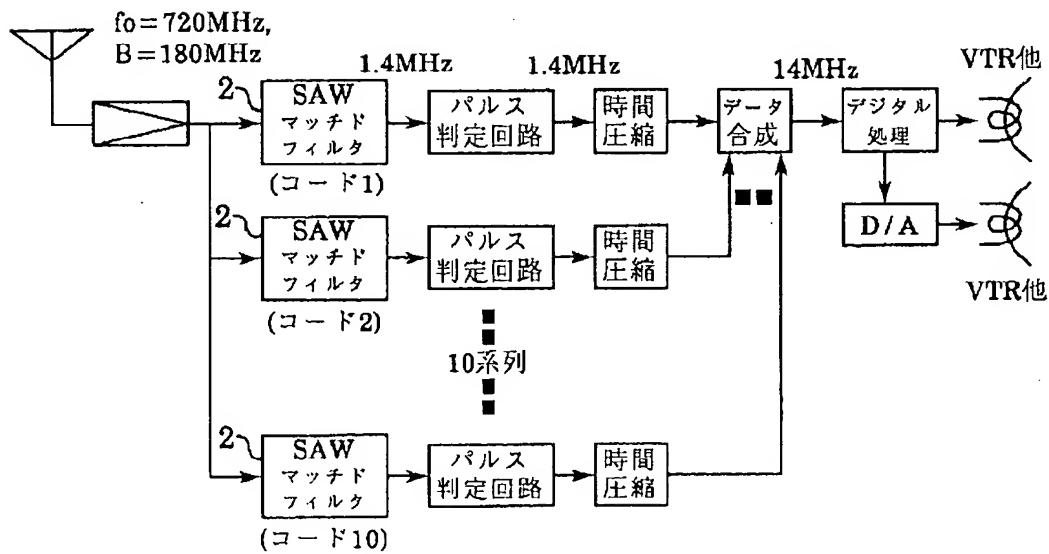
[Drawing 3]

図 3

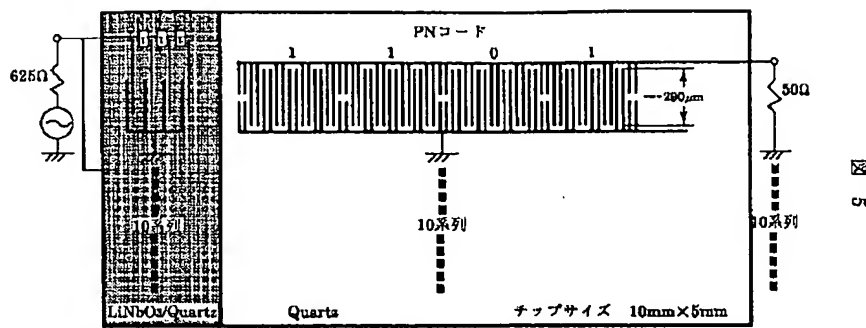


[Drawing 4]

図 4



[Drawing 5]



[Translation done.]